

**KSA-50S OWNER'S REFERENCE**

# INTRODUCTION

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Thank you for your purchase of the KRELL KSA-50S power amplifier. This amplifier represents the latest evolution in amplifier technology, matching unprecedented performance with convenience not obtainable from most high performance audio designs.

To obtain the best performance from your KSA-50S careful attention should be paid to placement, installation and operation. A thorough understanding of these details will help insure satisfactory operation and long life for the KSA-50S and related system components.

This Owner's Reference is divided into several sections, each designed to perform a different function. As you read through it you will become better acquainted with the features and functions that make the KSA-50S amplifier a superb value. A Question and Answer section is also included where answers to common questions are provided. Should you have any questions or suggestions please feel free to contact your authorized dealer or the KRELL staff for assistance.

In the unlikely event that your KSA-50S should require service, you will be pleased to know that it is backed by a comprehensive Customer Satisfaction policy and one of the most advanced service facilities in the industry. For detailed information on the terms and conditions of service, please refer to the Warranty and Service section of this Reference, Warranty Registration Card, and your authorized KRELL Dealer or Distributor.

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# TABLE OF CONTENTS

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4	UNPACKING
5	LOCATION AND REMOTE TURN-ON
6	CABINETRY AND AC POWER CONSIDERATIONS
7	AMPLIFIER FEET AND REMOTE MASTER/SLAVE CONNECTIONS
9	INPUT AND OUTPUT CONNECTIONS
12	AMPLIFIER OPERATION
13	TURN-ON DESCRIPTION
14	SYSTEM NOISE
15	BIAS LEVEL METER AND METER BUTTON
16	REMOTE CONTROL FUNCTIONS
17	PROTECTION CIRCUITRY
18	TROUBLESHOOTING STEPS
20	QUESTIONS AND ANSWERS
22	SPECIFICATIONS
23	WARRANTY AND SERVICE INFORMATION

# UNPACKING

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The following items will be visible once the box and foam have been removed:

- 1 KSA-50S stereo amplifier
- 1 Warranty card
- 1 AC power cord
- 4 Rubber feet bottoms

NOTE: If any of these items are not included, please contact your authorized dealer immediately for assistance.

NOTE: Save all packing materials. If you must ship your KSA-50S in the future, repack the unit in its original packaging to prevent transit damage. Should the unit require service, send the remote control (if purchased optionally) and AC power cord with the amplifier.

CAUTION: Do not connect the power cord to the AC mains before completing the Installation section.

## LOCATION

Place the KSA-50S on a firm level surface away from excessive dirt or moisture. When using custom racks or cabinetry, keep in mind the weight and ventilation requirements for the amplifier. Ideally the amplifier should be placed as close to the speakers as possible. It is preferable to run long balanced interconnect cables to the amplifier and keep speaker cable length to a minimum. Speaker cable adds impedance to the load the amplifier must drive, regardless of the cable's gauge. All KRELL amplifiers will drive the lowest impedances with ease. When impedance is added due to long cable lengths, amplifier power is literally wasted in driving the cable. Long speaker cables reduce the maximum power that can be delivered to the speakers.

## REMOTE TURN-ON INSTALLATION

Some installations do not have adequate space or arrangement flexibility for the amplifier to be placed near the speakers. To allow for this, the KSA-50S can be turned On or Off from a room other than the listening room. This type of amplifier placement is referred to as Remote Installation. There is an internal provision to allow the amplifier to be controlled from a wall AC receptacle and not from the front panel Power switch or remote control. The KSA-50S can be placed in a room or other space close to the speakers, out of sight, and turned On and Off from the listening room. We suggest a standard wall switch be mounted in the listening room to control an AC power outlet dedicated to the amplifier. This should be accomplished by an electrician. Please contact your dealer for assistance.

NOTE: When set-up for remote turn-on, the front panel Power switch will not operate, nor will the Power switch on the remote control. The Meter switches on the front panel and remote are not affected and will operate normally.

NOTE: Remember to keep speaker cable lengths to a minimum.

# BASIC INSTALLATION

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## CABINETS CONSIDERATIONS

High bias amplifiers dissipate much of the power they consume in heat. Because the KSA-50S utilizes Sustained Plateau Biasing (Patent Pending), it remains cool when not in use. When the KSA-50S is in use, it can become quite hot. Therefore, the KSA-50S should be installed in a location that provides unobstructed ventilation. If you must install the unit on shelves or in a cabinet, extra ventilation may be necessary. This often can be accomplished with cabinet shelf spacing or unit location. In more extreme instances the use of small fans can aid in removing excessive heat from internal spaces. Consult your dealer for assistance.

Generally, ventilation should be adequate with the front and rear of a cabinet open, 3-4 inches of clearance on each side, and 8 inches of vertical space.

The KSA-50S has a large power supply and output stage. As a consequence the amplifier is quite heavy. When purchasing a rack or cabinet, keep weight in mind. Most racks are not capable of withstanding the weight of these units.

The exact weight and dimensions for the KSA-50S are in the Specifications section of this manual.

## AC POWER CONSIDERATIONS

The KSA-50S should have a dedicated 15 amp line and should only be operated with the supplied power cord. Use of other power cords may damage the amplifier and void its warranty. Please consult KRELL or your dealer BEFORE using any devices designed to alter or stabilize the AC power for the KSA-50S. AC line filters and/or stabilizers must meet or exceed the power transformer size in the amplifier. The KSA-50S requires a line conditioner with a supply reservoir greater than 800 VA. If you have any questions about placement or AC power conditions, please consult KRELL.

## AMPLIFIER FEET

The feet on the KSA-50S can be used in several different ways. They are made from machined Delrin and are supplied with separate threaded rubber bottoms. The rubber bottoms can be screwed into the feet for the protection of fragile surfaces such as hardwood floors or furniture. For use on rugs, we recommend using the feet without the rubber bottoms. KSA-50S feet can also accept the KRELL AMDs (Acoustic Mass Damper). The AMD is a spiked foot that threads into the bottom of the standard feet. These improve the amplifier's sonic performance in most installations and are particularly effective on carpeted floors. Please contact your dealer or KRELL with any questions.

## REMOTE, MASTER/ SLAVE CONNECTIONS - LINKING MULTIPLE AMPLIFIERS

There are two Remote connectors on the back of the KSA-50S labeled Master and Slave provided for linking multiple amplifiers together. When the Master/Slave cables are connected to each of the amplifiers involved, their Meter function controls and On/Off capabilities will be linked and controlled from one amplifier. This avoids the possibility of one amplifier reacting to the remote control while the other remains unchanged. This can become quite annoying if the amplifiers are on opposite sides of the room.

Select the amplifier that you want to receive operation commands. That amplifier will be the Master. Follow the instructions below for connecting the amplifiers. Consider the Master receptacle the output and the Slave receptacle the input.

1. Turn off all of the amplifiers before starting. This insures all amplifiers are synchronized when the cabling is connected. Connect one end of the linking cable to the Master output on the back panel.
2. Connect the other end of the linking cable to the Slave input on the second amplifier.
3. To synchronize three amplifiers, connect a second linking cable to the Master output on the second amplifier. Connect the remaining end to the Slave input on the third amplifier.

# BASIC INSTALLATION

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4. Connect additional amplifiers as described in step 3.

5. When the cables are all in place, point the remote control at the amplifier designated as Master and press the Power button. The amplifiers will simultaneously turn on.

The Meter display for each amplifier may vary. Manually change the meter display via the front panel until all of the meters match. The amplifier will remember the meter setting when cycled On/Off via the remote control or front panel switch. If the unit is unplugged the memory will not remain and the meters may need to be resynchronized. When linked and synchronized correctly, On/Off and meter functions will happen simultaneously only when the remote control is used.

NOTE: Each individual amplifier can be turned ON/OFF and have meter functions changed via the front panel separately. If you change an individual amplifier's function, it needs to be manually changed back to follow the functions of the other amplifiers so the synchronization remains intact.

NOTE: Contact your dealer or KRELL Industries to obtain remote cable links.



## INPUT AND OUTPUT CONNECTIONS

**CAUTION:** When making connections to this component or any other, make sure the power amplifier is OFF and the preamplifier is in the MUTE or STAND-BY mode.

The wiring to and from the amplifier, and all components in general, should be arranged in a neat, organized manner. Specifically, AC wires should be separated from audio wires. This practice avoids hum or other unwanted noise from being induced into the system.

1. Connect the speaker cables to the amplifier's output terminals.

The KSA-50S utilizes a custom set of binding posts for the left and right channels. The binding post will only accept a spade lug or ring terminal of proper inner radius. Bare wire, banana lugs or pins will not work. Each binding post is labeled either (+) or (-) on the rear panel. The (+) sign below the binding posts indicates the positive output terminal. This is commonly referred to as red or hot. The (-) sign below the binding posts indicates the negative output terminal. This is commonly referred to as black or ground.

**CAUTION:** Make sure all cable terminations are of the highest quality, free from frayed ends, shorts or cold solder joints.

2. Connect the interconnect cables from your preamplifier to the input of the KSA-50S.

The KSA-50S has balanced and single-ended inputs. The balanced inputs use 3-pin XLR connectors and the single-ended inputs use standard RCA connectors. We recommend use of balanced interconnects for sonic and electrical reasons. Balanced termination will reduce noise and not incur significant sonic loss due to extreme cable lengths, as is common with single-ended connections.

# CONNECTIONS

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CAUTION: Use only one input to the amplifier at a time. The KSA-50S is shipped with shorting pins in the XLR inputs. These pins should remain in the XLR inputs if you are operating the KSA-50S in the single-ended mode. When the shorting pin is inserted, pin 1 and pin 3 are shorted together. The shorting pins must be removed to connect the KSA-50S for balanced operation.

The pin assignment for the XLR is:

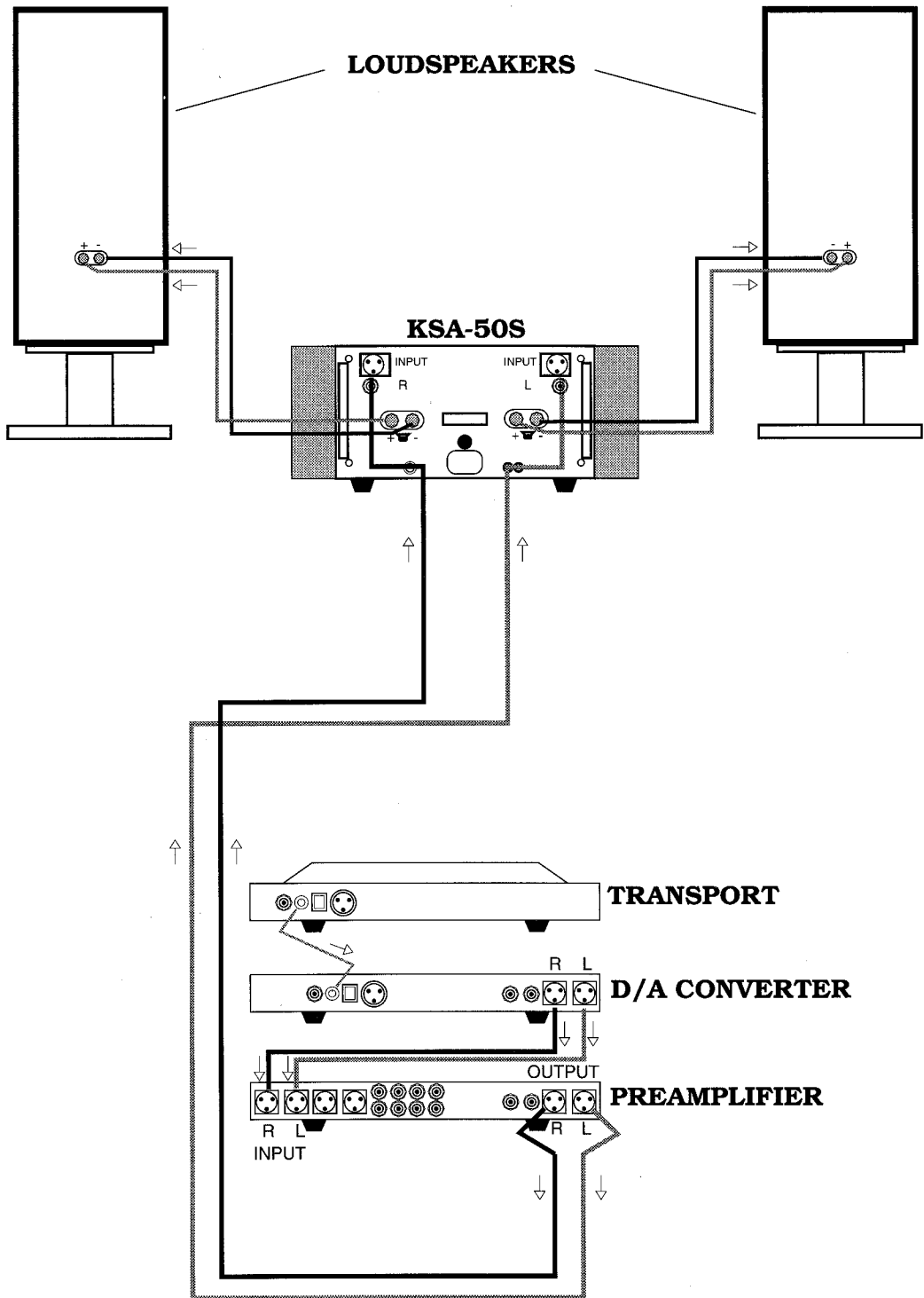
pin 1 = shield (ground)

pin 2 = non-inverting input (hot or +)

pin 3 = inverting input (-)

NOTE: The RCA center conductor for each channel is wired in parallel with pin 2, the non-inverted input. Only one of these inputs should be connected to a preamplifier. Do not attempt to use the single-ended and balanced inputs simultaneously.

3. Insert the AC power cord into the receptacle located on the back of the KSA-50S. Insert the other end into the wall AC receptacle. (Refer to the Basic Installation section for AC power requirements)
4. The amplifier is now ready for operation. Should you have any questions regarding system set-up, contact your dealer or KRELL Industries.



## AMPLIFIER OPERATION

Understanding the operation of the amplifier is very easy. Equally important is an understanding of the care that should be exercised when operating the system as a whole in relation to the power output of the KSA-50S. Simple mistakes, such as switching between active sources without muting the preamplifier output or bumping/miscuing a cartridge can generate large transients at low frequencies. With this type of transient the KSA-50S can generate enough power to damage most loudspeakers. All switching of sources should be done with the preamplifier level either muted or fully attenuated. Inputs to the amplifier should not be changed while the amplifier is on.

NOTE: Care must be taken when setting high playback levels. Because of their tremendous reserve of clean power, KRELL amplifiers safely drive speakers to higher sound pressure levels than other amplifiers. This also means driving the speakers to their limit. Always turn the level down at the first sign of distortion.

When turning the system off, turn the volume on the preamplifier all the way down or put it into the MUTE or STAND-BY position. Turn the amplifier off before any other component. This avoids the possibility of a turn-off transient from another component getting to the speakers. Because of the tremendous output power in the KSA-50S, the amplifier should not be turned On/ Off with music playing. This can arc the speaker output relays and potentially damage the amplifier.

## DESCRIPTION OF TURN-ON SEQUENCE

When turning on the system, the amplifier should always be last.

The KSA-50S On/Off switch is part of a multi-level turn-on circuit that goes through several steps of protection. Upon turn-on, the amplifier's outputs are not connected to the speakers. After the protection circuits have determined that the unit has completely stabilized, the speaker relays will engage. You will hear a click at this point. The Bias circuit will start at the highest bias level upon turn-on and will step down to the stand-by bias level. There are two levels of bias and a stand-by in the KSA-50S. This process takes approximately one minute. If you press the meter button right after turn-on, you can watch the bias level test. The amplifier is ready to use once the speaker relays are engaged. The speaker relays and bias levels are not related. The amplifier can be operated as soon as the speaker relays engage regardless of the bias level position indicated at start-up.

1. Push the black Power button on the amplifier front panel to turn it on. The Power button is the larger of the two buttons at the top of the face plate. The blue LED labeled POWER in the center of the bias meter will illuminate when the Power button is depressed. The amplifier will progress through the turn-on sequence described above.
2. With the preamplifier in the Mute position, or volume control fully attenuated, select a source. After the speaker relays have engaged, turn the volume control up to your desired listening level.
3. Enjoy.

## SYSTEM NOISE CONSIDERATIONS

AC grounding often becomes critical when connecting high performance audio gear. When mixing and matching audio components, each with their own ground potentials, a low frequency hum can become present in one or both speakers. This can often occur when introducing a new component into the system.

If there is a low frequency hum coming from the speakers when the KSA-50S is connected into the system, follow these simple trouble-shooting steps:

1. Check all input and output connections, making sure they are of sound construction. With the amplifier off, remove the interconnect wiring and turn the amplifier back on. If the hum disappears, shut the amplifier off and reinsert one of the interconnect cables and turn the amplifier back on. If the hum is present with one or both interconnects inserted, there may be a defective cable. Have the interconnect cabling checked before proceeding.
2. If the interconnect proves to be fine, more than likely you are experiencing a ground loop. This usually can be easily eliminated. Contact your dealer or KRELL for assistance.

## BIAS LEVEL METER

The KSA-50S amplifier utilizes Sustained Plateau Biasing, a proprietary KRELL design. The Bias Display Meter on the front panel of the amplifier displays which level of bias the amplifier is utilizing. Unlike sliding bias designs, Sustained Plateau Bias only changes level when the demand situation relative to input and source material changes. The signal passes through a section called an Anticipator circuit. Once the level of bias is determined by the Anticipator circuit, it automatically biases the output of the amplifier to one of three levels before the signal is passed through the output stage. The Anticipator circuit is many times faster than the output stage itself. This technique insures all signal is passed through the amplifier in pure Class A operation. If the amplifier requires only a low level of Class A bias, the amplifier will bias itself to use only the amount of Class A power necessary to the demand parameters. Should the signal demand parameters exceed the bias level the amplifier is presently working under, the amplifier will increase its bias to the next level. This technique allows all signal to come through in Class A operation. If the signal demand parameters are less than the bias level provides for more than 15-20 seconds, the amplifier will drop to the next lowest bias level. This allows higher efficiency of power used and less heat generation. The bias levels are indicated by appropriate LEDs in the Bias Level Meter as they are activated.

Should the signal demand parameters reach a point at which the temperature of the external heatsink is approximately 80 degrees Celsius, the last level of bias will be disabled until the heatsink temperature drops to a safe operating level. The overall output power of the amplifier is not changed when this occurs, only the amount of Class A power. You will notice the LEDs corresponding to the top level of bias will not illuminate. The LEDs will come back on when the heatsink temperature is at safe operating levels. This temperature fluctuation will not harm the amplifier. It is provided for consumer safety in a home listening environment.

## FRONT PANEL METER BUTTON

A small button beneath the Power button on the front panel controls Bias Level Meter display illumination. When engaged, the display will no longer indicate bias levels; only the Blue pilot LED will be visible. The Bias Level Meter can also be turned on or off via the remote control.

## REMOTE CONTROL FUNCTIONS

The KSA S-series are the first high performance amplifiers to utilize remote control functions. The amplifiers can be switched on or off and the meter illumination can be changed from your listening position via the hand-held remote control.

**SPECIAL NOTE:** The remote control is optional with the KSA-50S.

The KSA-50S remote control duplicates the front panel switches on the amplifier. The Power button will turn the amplifier on and off, while the Meter button will switch the bias LEDs on or off.

When the amplifier is switched On, the Blue power LED and Bias Level Meter will illuminate. When the amplifier is switched Off, no LEDs will be illuminated.

When the Bias Level Meter is turned off, no LEDs will be visible except for the blue pilot LED. When the Bias Meter display is on, the bias level will be displayed with the appropriate LEDs.

## BATTERY INSTALLATION

**NOTE:** Batteries should be replaced when the KSA-50S functions from the remote control become intermittent.

1. Remove the four hex head screws from the back of the remote control.
2. Remove the back plate to expose the battery storage compartment.
3. Replace batteries (Refer to the polarity drawing while inserting the batteries).
4. Replace the back plate and insert the four hex head screws.



## PROTECTION CIRCUITRY

There are no fuses in the KSA-50S. The amplifier is protected by a series of non-intrusive, opto-coupled circuits that constantly evaluate the amplifier's operation. Appropriate protective action exists for DC conditions, short circuit, oscillation, AC power anomalies, high ground resistance and out-of-phase ground. Collectively, the protection circuitry is designed to avoid damage to the amplifier or speakers caused by other defective components, faulty wiring, mishandling of the system or amplifier failure. When the protection circuit is engaged, the amplifier will shut off and short its output. The amplifier can be turned on after resolving either the input or output problem.

## SIMPLE TROUBLE-SHOOTING STEPS

Follow these steps when trying to resolve the cause of potential amplifier related failure. If the amplifier will not turn on, or stay on:

1. Disconnect all input and output connections. Once this is completed, try turning the amplifier on.

If the amplifier does not come on, check the circuit breaker on the back panel. If the circuit breaker has popped out or appears to be more extended than usual, reset the breaker switch by pressing it back in. If the amplifier still does not come back on, call KRELL, your dealer, or distributor.

If the amplifier does not come on and the circuit breaker on the back of the unit seems normal, check the house circuit breaker or fuse for the power outlet associated with the amplifier.

NOTE: When turning the amplifier on and off between cable checks, let the amplifier settle for at least 45 seconds before turning it back on.

2. If the amplifier turns on and appears to work properly again, turn the amplifier off and reconnect the output speaker cables for one channel only. If the amplifier turns on normally, reconnect the other channel output speaker cables. Should the amplifier turn off when either output cable is connected, the problem is cable or speaker related. Check to make sure there are good mechanical connections on the speaker cabling and there are no frayed ends or wires shorting the output terminals together. Have your speaker cables checked and repaired if necessary by your dealer before proceeding.

3. If the amplifier turns on normally with only the speaker cables connected to the output, turn the amplifier off and reconnect the interconnect cable for one channel only. If the amplifier turns on normally reconnect the other channel's interconnect cable and turn on the amplifier.

Should the amplifier turn off when either interconnect cable is connected, the problem is cable, preamp or source component related.

Check to make sure there are good mechanical connections on the interconnect cabling and there are no broken terminations. Have your interconnect cables checked and repaired if necessary by your dealer before proceeding.

Should the cabling from the preamplifier to the amplifier input be functional, check source component interconnects. Should the interconnects prove to be sound throughout the system, have the preamplifier and any suspect source components checked. The source components should be checked individually through the preamp, if the preamp proves to work properly.

4. Should all of the system components, cabling and AC power requirements be sound and the amplifier continues to not work, call your dealer, distributor or KRELL to arrange for service. Service can be handled directly through KRELL. Should you need a KRELL component serviced please call the factory to discuss the problem and obtain a Return Authorization number (RA#) and shipping information.

## QUESTIONS AND ANSWERS

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Q. Should I leave the KSA-50S on at all times?

A. Because of Sustained Plateau Bias, the KSA-50S can be left on at all times without fear of damage, excessive heat or excessive power consumption. The KSA-50S however, is designed to be turned On/Off, and can do so without degradation. The amplifier will work at full performance within minutes of turn-on.

Q. When I push the Power button on the front of the KSA-50S, the amplifier doesn't turn on. What should I do?

A. Check the input and output connections, then retry the amplifier. Check the circuit breaker on the back of the unit and reset it if necessary. Consult the protection circuitry section of this manual or for more detailed trouble-shooting procedures the simple trouble-shooting guide on page 18.

Q. When I turn the amplifier on there is a loud hum through the speakers. There was never a hum before the KSA-50S was in the system. What should I do?

A. Often when a new component is introduced into an audio system a hum may become present. This is often caused by a ground loop in the system or by defective cabling. Check your cables to and from the amplifier. If the hum persists, contact your dealer or the KRELL staff for assistance. Refer to the Input and Output connections section on page 9 for more detail.

Q. Can I use special audio power cords on the KSA-50S?

A. You can experiment with special power cords as long as they are grounded on both ends, meet the amplifier's 15 amp power requirement, and are safety approved by organizations like CSA or UL. The use of them, however, is not recommended without first consulting your dealer or the KRELL factory.

Q. When I connected the KSA-50S to my system with the single-ended inputs, a loud buzz came through my speakers. Is the amplifier broken?

A. The KSA-50S has special shorting pins in the XLR inputs that enable the amplifier to function properly with the single-ended inputs. If the shorting pins are not inserted between pin one and three, the 180 degree input will be open to excess noise. Otherwise single-ended inputs will work fine with the unit. The performance of the amplifier is much improved when using the balanced inputs and noise problems are often eliminated. Interconnect cables can also pick up ambient noise from AC power cords, power supplies or motors. Investigate whether the cabling is in close proximity to the items mentioned above. If so, experiment with cable placement.

Q. I have two KSA-50S amplifiers in my system and when I press the Power button on the remote control one amp turns on and the other stays off. What can I do to turn both amps on at the same time?

A. The two amplifiers can be connected with a remote link cable. This makes it possible to synchronize power and meter functions between the two amplifiers. Refer to the Remote Master/ Slave Connections section of this Reference on page 8.

Q. When listening to music sometimes there is a difference in bias level between the left and right channel. Is there an imbalance between the channels of my amplifier.

A. No. The bias level indicators display the bias level not output level. If there is more information on one channel due to the recorded material the bias level may need to be increased. This is perfectly normal as most recordings are not completely symmetrical.

# SPECIFICATIONS

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AMPLIFIER	KSA-50S
THD (1KHz/20KHz)	$\leq 0.018\%$ / $0.18\%$ <i>.02%</i>
GAIN	26.0dB
SIGNAL TO NOISE	$\geq -100$ dB
INPUT SENSITIVITY	1.34VRMS
INPUT IMPEDANCE	47K
OUTPUT VOLTAGE (PEAK TO PEAK/RMS)	75.8 / 26.8
OUTPUT POWER, continuous per channel	
8 $\Omega$ (ohms)	50W
4 $\Omega$	100W
2 $\Omega$	200W
1 $\Omega$	400W
MAX OUTPUT CURRENT	60 AMPS
DIMENSIONS	
LENGTH	14.75"
WIDTH	19.00"
HEIGHT	8.50"
UNIT WEIGHT	52 LBS
SHIPPING WEIGHT	65 LBS

All operational features, functions, and specifications are subject to change without notification.

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## WARRANTY AND SERVICE

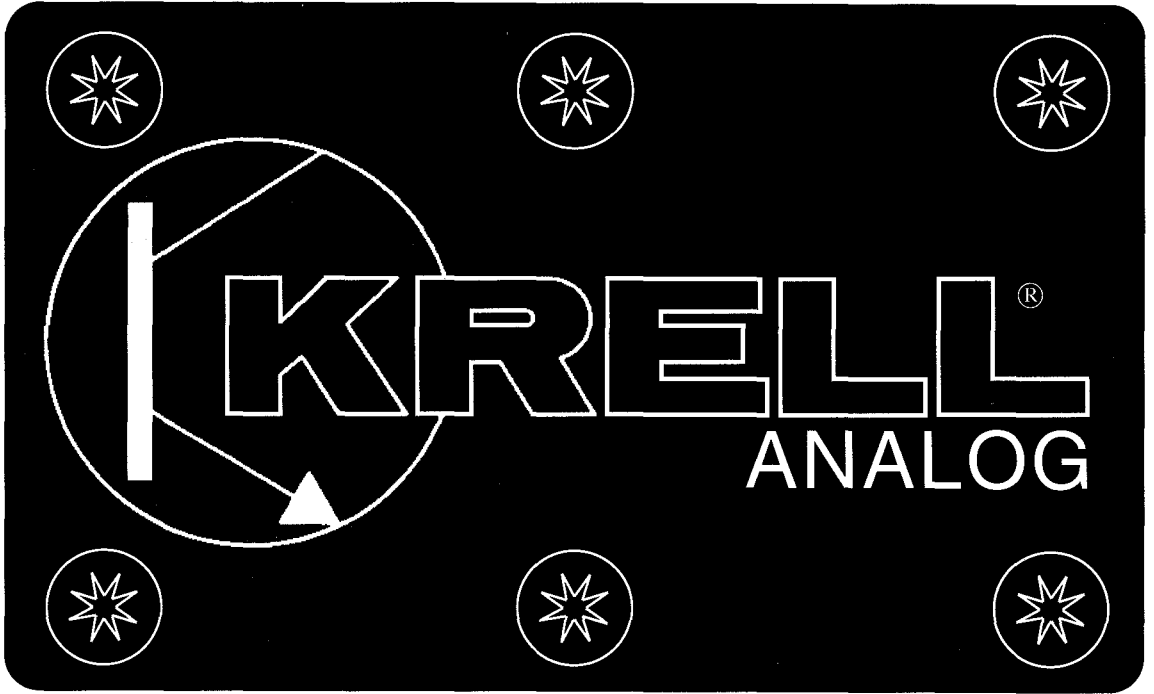
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There are no user-serviceable parts inside the KSA-50S. The KSA-50S has a limited warranty of five years parts and labor. Return freight is included in the warranty. The warranty period begins on the date of purchase and is activated with the return of the enclosed Warranty Card and a copy of the Sales receipt. Please return the Warranty Card immediately after successful installation and operation are completed.

The warranty for KRELL products is valid only in the country to which they were originally shipped and at the factory. If you think there are problems with your unit, please contact your dealer, distributor or the factory immediately.

The operating voltage of this unit is determined by the factory and can only be changed by an authorized KRELL distributor or the KRELL factory. Any unauthorized voltage conversion will void the warranty. Should the operating voltage of your KSA-50S require changing, contact KRELL Industries.

Please do not return any unit to KRELL for repair without first calling to discuss the problem and to obtain a Return Authorization number. Freight to the factory or distributor is your responsibility. Return freight to you will be paid by the factory or distributor. Any unauthorized disassembly, updates or modifications performed to the unit will void the warranty.



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